

Green Power Markets: An Overview

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Road Map

- Green pricing
- Green marketing
- Impact to date
- Green-e
- Green-e and waste-to-energy
- Resources



Why Green Power?

- Historical high public acceptance of renewable energy technologies
- Product differentiation



Defining Green Power

- Environmentally preferred electricity
- Usually contains a significant amount of renewable energy
 - Executive Order 13123: “energy produced by solar, wind, geothermal, and biomass power”
 - Hydro excluded, though some environmental groups consider low-impact hydro to be renewable



Buying Green Power

- **Regulated Markets**
 - Over 50 utility programs operate green pricing programs
- **Competitive Markets**
 - Green power offerings in CA, CT, MA, ME, NJ, PA, NY, IL

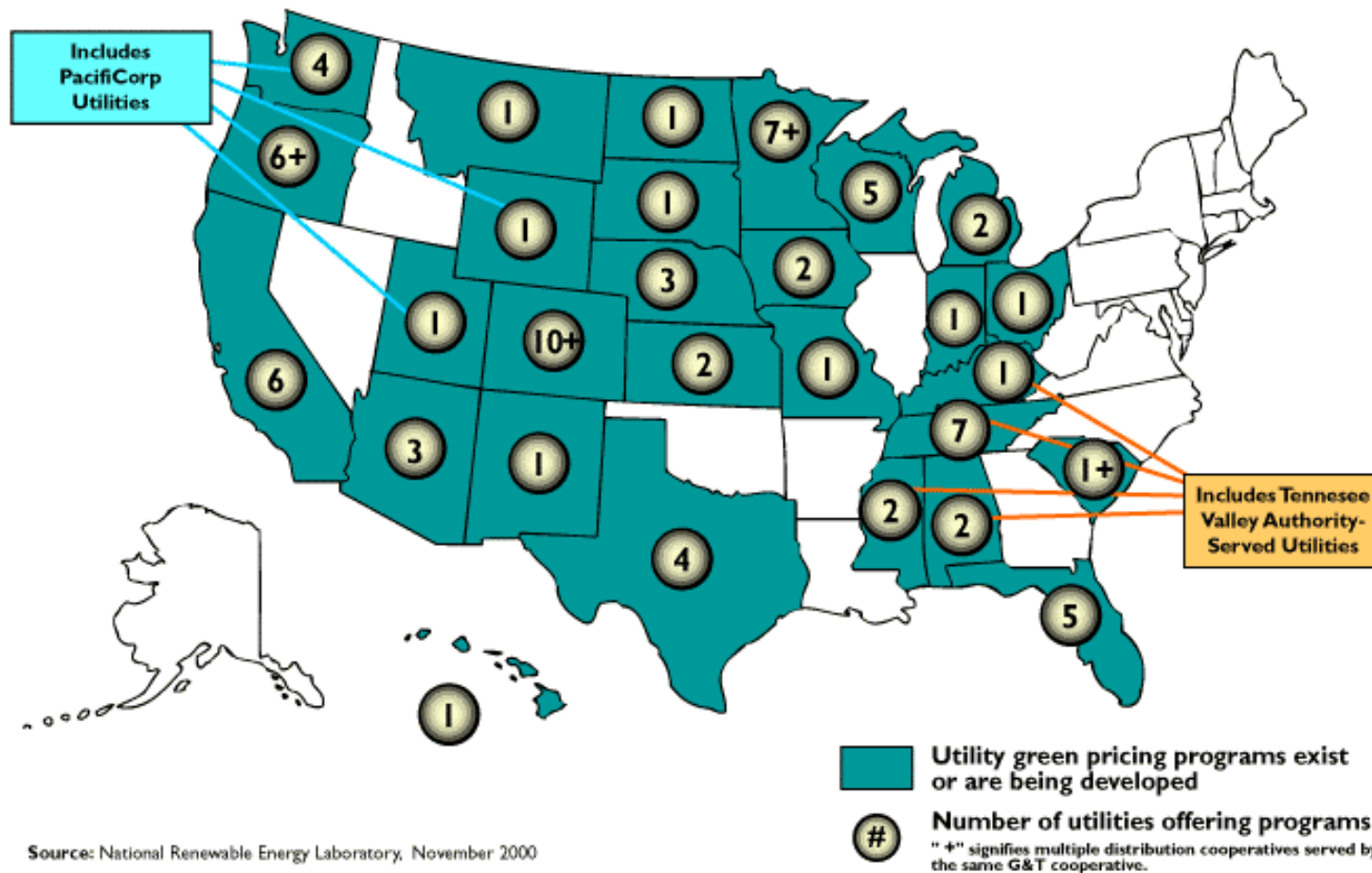


Types of Green Pricing

- **Energy Tariffs**
 - kWh blocks
- **Capacity Tariffs**
 - kW blocks
- **Contribution Programs**
 - Voluntary donations, often support demonstration programs
- **Finance Programs**
 - Payments to lease or finance, and install, customer-sited PV systems

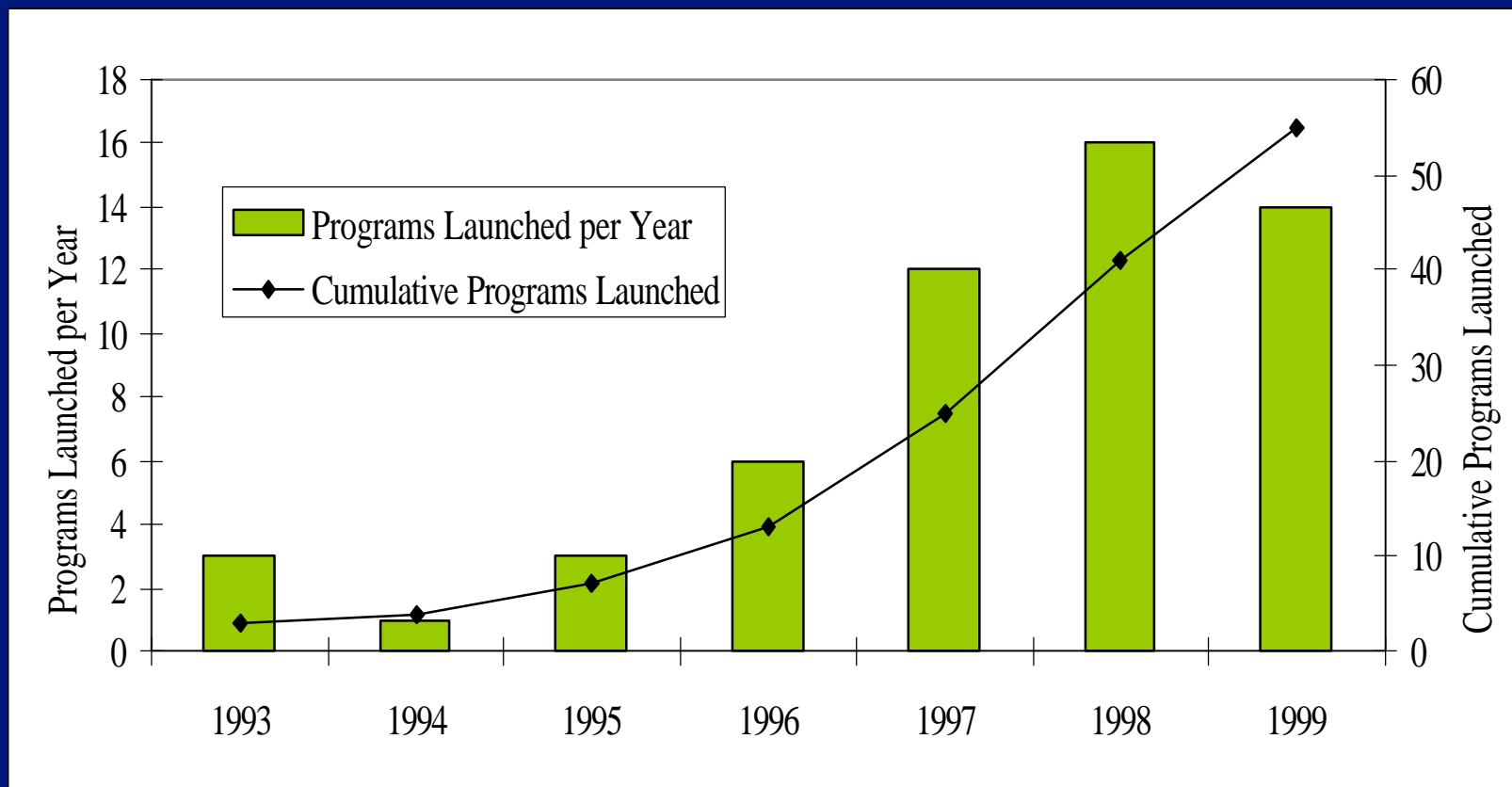


Utility Green Pricing Activities

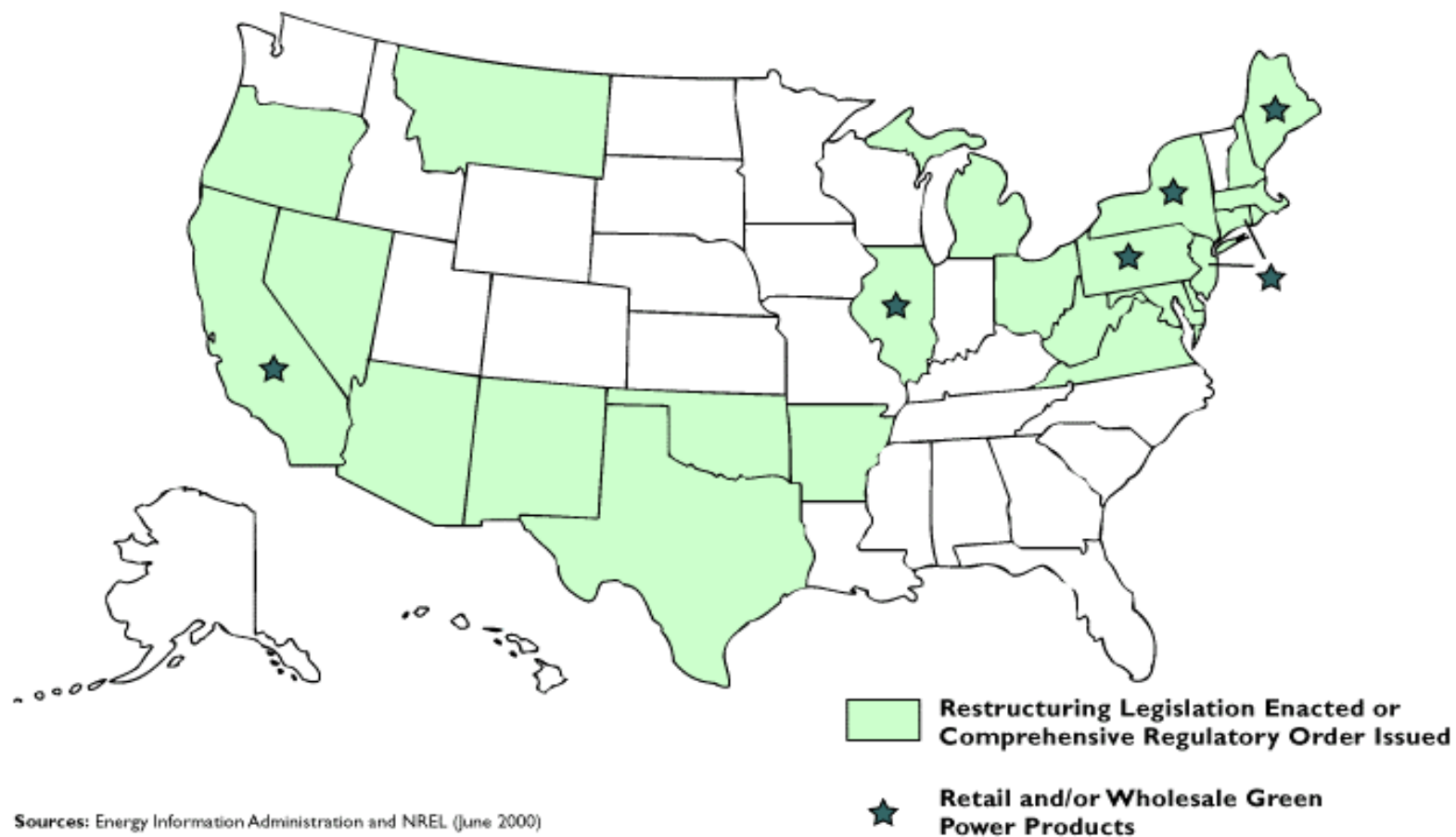


Source: National Renewable Energy Laboratory, November 2000

The Growth of Green Pricing



States with Competitive Green Power Offerings



Sources: Energy Information Administration and NREL (June 2000)



The Growth of Green Power Marketing

	New Competitive Green Power Markets	States	Cumulative Competitive Green Power Markets
1998	3	CA, MA, RI	3
1999	2	PA, NJ	5
2000	3	ME, IL, CT	8



Green Market Products

- 31 retail green products in total, sold by 16 retail marketers serving small customers
 - CA: 13 products, 9 marketers
 - PA: 10 products, 6 marketers
 - NJ: 5 products, 3 marketers
 - MA and RI: 1 product, 1 marketer
 - ME: 1 product, 1 marketer
 - CT: 1 product, 1 marketer



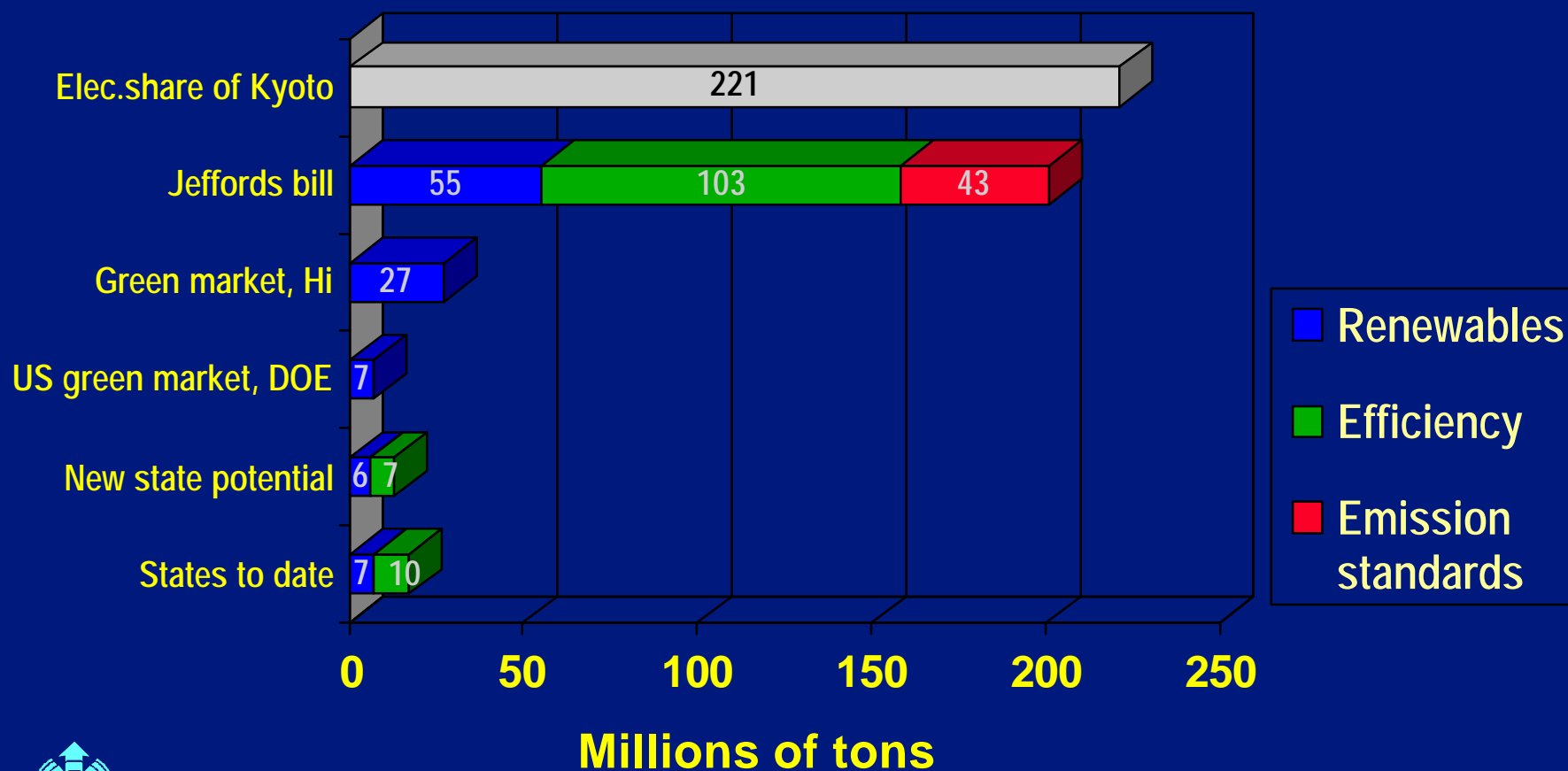
The Story So Far...

- 40% of households have access to green power
 - Green Pricing: 20 million
 - Competitive Markets: 17 million
- 380,000 households are buying green power
 - Green Pricing: 130,000 households
 - Competitive Markets: 250,000 households
 - 165,000 in CA; 80,000 in PA, much less elsewhere
- 330 aMW of renewables being supported
 - Green Pricing: 50 aMW
 - Competitive Markets: 280 aMW



Carbon emission reductions

Projected by 2010



Sources: States - UCS; Green market, Hi - EPA; Jeffords - ACEEE

Green-e

- A voluntary environmental certification program for renewable power products sold in restructured markets
- Currently in California, Mid-Atlantic, New England
- Planned for Southwest, Midwest, Texas



Eligibility Criteria

Green-e certified products:

- At least 50% of product is renewable
- Emissions from any non-renewable portion must not exceed average emissions from system power for SO_x , NO_x , and CO_2
- No specific purchases of nuclear power
- Has a percentage of *new* renewable resources



Regional Green-e Standards

- Waste-to-energy accepted in California but not in New England or the Mid-Atlantic
- Biomass accepted in California and with restrictions in New England and the Mid-Atlantic



Low Emission Biomass Provisions in New England and Mid-Atlantic Green-e

Low emission biomass which is defined as:

Any biomass facility which meets a NO_x standard of

- (a) 2.9 lbs. per megawatt hour in years 1-3
- (b) 2.63 lbs. per megawatt hour in years 3-6
- (c) 2.25 lbs. per megawatt hour in years 6-9

The definition of biomass includes landfill gas.

Emissions trading among a portfolio of biomass facilities may be allowed.



Biomass Fuel Restrictions in Mid-Atlantic Green-e

- Excludes the following:
 - timber cuttings and thinnings
 - herbaceous crop residues (stalks, leaves and other readily compostable material), but orchard trimmings, hulls and pits are eligible



Waste-to-Energy and Green-e

- Improve public acceptance of waste-to-energy
- Continue with information and data updates
- Be prepared to accept restrictions on emissions, fuels, and perhaps other provisions
 - mercury?
 - dioxin?
 - Recycling?
 - Can't burn recyclable materials?



Resources

- NREL
 - <http://www.nrel.gov/analysis/emma>
- Green Power Network
 - <http://www.eren.doe.gov/greenpower/>
- Green-e
 - <http://www.green-e.org>
- Lawrence Berkeley National Laboratory
 - <http://eetd.lbl.gov/EA/EMP>

